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17. ABSTRACT (MAX. 250 WORDS)

The primary objective of the language enrichment program at the child care center was to prevent future learning disabilities in language development. It involved a group of over 41 pre-school, kindergarten and first grade children. Lessons in the program emphasized auditory and visual discrimination skills. The environment was enriched through provision of materials such as games, books and records; various excursions were taken to develop experimental background.

Certain standardized testing instruments measuring reading readiness, early reading achievement, oral language problems, and intelligence were selected to ascertain what benefits may have accrued to the children involved in the program. The experimental and control groups chosen were only roughly comparable. From the data obtained with the measuring instruments, no superiority in reading readiness, reading achievement or intelligence quotient gains was demonstrated in children attending the child care language enrichment programs as compared to other similar child care programs. However, both groups showed gains in IQ over previous testing.

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REPORT OF EVALUATION OF LANGUAGE ENRICHMENT PROGRAM AT STONEHURST CHILD CARE CENTER

This report of evaluation must be prefaced by a statement regarding its limitations. A considerable amount of time was devoted to the development of a research design for the evaluation of this program. A great deal of time was invested in the execution of the evaluation plans. These plans and efforts met with frustration as the result of a number of factors, however. Among these were transiency in already small study groups, the amounts of time required for individual testing, and the fact that staff members who shared responsibility for the data collection had other heavy demands on their schedules. There are some suggestions in the data that the populations of the two child care centers were not as similar initially as would be required for experimental control comparisons.

The reason the study is included at this time is to report on the techniques and the amount of time devoted. No particular significance can be placed on the results contained herein because of the sampling problems (sizes and baseline comparability) which were encountered.

I. INTRODUCTION

The primary objective of the language enrichment program at Stonehurst Child Care Center has been to prevent future learning disabilities in the area of language development. This objective is based on the following assumptions which were set forth in the original proposal to the Ford Foundation:

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> "Many newcomer and culturally deprived children, regardless of age or grade level, are unable to read adequately, yet ability to read is a fundamental skill essential for success in school and out. The prevalence of reading disability and its serious implications justify a mass attack on this educational deficiency.
>
> "In the child care centers, a high proportion of the children cared for are subject to conditions of transiency, poverty, cultural deprivation and broken families. Many of these children begin school with handicaps to their learning which they may never overcome. Work in the child care centers, therefore, offers an opportunity to prevent future disabilities."[1]

The program at Stonehurst Child Care Center has involved a group of over forty preschool, kindergarten, and first grade children. The special language development program has been based on a series of approximately 100 lessons developed by Mrs. Dorothy Hansen, a Project staff member. These are brief lessons, 15 to 30 minutes long, emphasizing auditory and visual discrimination skills. They have been taught daily by regular members of the child care center staff. The program also included enriching the environment of the center through provision of materials (e.g. games, toys, books, records) and by making possible various excursions to develop experiential background prerequisite to the full development of language and language skills.

Another phase of the program, not covered by the present evaluation efforts, was in the area of parent education. This took the form of a series of evening discussion groups. Evidence of the success of this program is reflected in the substantial and consistent attendance record at these meetings.

Results of auditory and visual discrimination training experiments and an extensive verbal learning experiment, carried on by Mrs. Hansen and her husband, are available by contacting the Hansens.

II. PROBLEM

Assuming that the enrichment program would enhance the children's preparation for, or readiness for, language instruction certain standardized testing instruments measuring reading readiness, early reading achievement, oral language problems, and

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1 Proposal to the Ford Foundation for a Program of Community Development, page 19

intelligence were selected for the purpose of ascertaining what benfits may have accrued in the children involved in the enrichment program. The potential effects of an enrichment program for deprived children are, in all probability, diverse and perhaps rather subtle in nature. There are many benefits which may have accrued which would not manifest themselves on standardized testing instruments or in other attempts at quantification. The latter (testing instruments) are, however, the tools with which the present evaluation has been done. It will not be possible to ascertain from the present data the effects of the program on the motivational characteristics of the children or their feelings about self, etc. Present evaluation efforts center on the determination of the effects of the enrichment program on selected aspects of the language development of the child care attenders. Assuming that positive effects of such a program would manifest themselves in performance on standardized tests, it is possible to formulate questions related to benefits which may have occurred as a result of the child care language enrichment program.

A. Will children in the language enrichment program show improvements in their scores (I.Q.) on the Peabody Vocabulary Test?

B. Will I.Q. scores of children in the Stonehurst language enrichment program increase more than children in the control child care center?

C. Will children in the Stonehurst language enrichment program perform better than comparable children at the control child care center on reading readiness, reading achievement, and speech diagnostic tests?

III. METHOD

A. Selection of Experimental and Control Centers

Both Stonehurst and control child care centers are located within the area selected as the Oakland Interagency Project area; roughly defined by the high school district boundaries. They have been described by child care center staff as comparable in terms of racial composition, economic level, transiency, etc. The children in both centers come, in great part,

from homes where fathers are absent, mothers must work, and families are composed of products of existing and previously existing marriages, as reflected in the variety of surnames carried by the children within one family group.

An attempt was made to document the family and economic conditions experienced by these children but a number of problems surrounding the collection of this information made the analysis of these data unfeasible.

B. Subjects of this Evaluation Study

From the beginning of the enrichment program an attempt was made to obtain baseline psychometric measurements on all children at both centers in the age categories of two years to six years. This became a very difficult task, however, due to the time involved, the busy schedule at the center, and the child turnover in the centers which was mentioned in the opening paragraphs.

This problem of transiency is reflected in the fact that more than twice as much testing was done on subjects than is reported in the tables giving the results. This was due to problems of following up children who were ill, temporarily not enrolled, no longer in the community, etc. The small sizes of various of the study sub-groups are thus partially explained.

In the early planning for evaluation it was anticipated that matching of experimental and control subjects would be possible. The unfeasibility of this, however, becomes apparent when one discovers the sub-group sizes. As will be seen in the following section on results, these sub-groups range in size from five to fourteen. The elimination of "non-matching" cases would have nearly destroyed some sub-groups. It is fully realized that the experimental and control groups are only roughly comparable.

Table 1 below presents the total numbers of children in each age category who were included in the study. These are children for whom there were complete data in one or more types of testing. In other words, a child may have been

included in a study of I.Q. changes but not in a section on reading readiness because the latter data were not available.

Table 1. Numbers of Subjects in Child Care Language Enrichment Project Evaluation Study

AGE GROUPS*	STONEHURST CHILD CARE CENTER (Experimental)			CONTROL CHILD CARE CENTER (Control)		
	Boys	Girls	Total	Boys	Girls	Total
6 year olds - first grade	8	6	14	4	3	7
5 year olds - kindergarten	6	9	15	6	7	13
4 year olds - pre-school	5	9	14	3	8	11
TOTALS	19	24	43	13	18	31

*These descriptive categories are based on status during the 1963-64 school year. Original involvement, in some cases, began when they were three, four and five years old. Data on the original two-year old group are not included.

C. Measuring Instruments

Measurements were obtained with five instruments-three normed, standardized tests; one diagnostic instrument; and one teacher rating scale devised by the Research Assistant.

The selection, or use, of these particular standardized tests was influenced by several factors. The number and quality of tests intended for use with children of ages two to six are somewhat limited. This was compounded by the matter of time and personnel to do testing. The cost of

lengthier and/or more individualized measurement would have been prohibitive. In an action program much baseline information (test scores) must be obtained from that which is available from other sources (e.g. tests already given by regular classroom teachers). This was the case in the present study and in order to maintain comparable information on subsequent groups and follow-up it was necessary to use the same instruments —

1. Peabody Peiture Vocabulary Test is a test of concept formation. A deviation I.Q. score is yielded. The testing procedure involves the oral presentation of a stimulus word with the subject indicating his comprehension by pointing to an appropriate picture. The index is thereby determined partially by the subject's understanding of oral language. This test was selected because of its briefness, language orientation, and appropriateness at early age levels.

2. Lee-Clark Reading Readiness Test. This test measures various conceptual and perceptual skills judged to be basic to readiness for learning to read. The scores obtained from matching tasks, etc., gives one a prediction of a child's future success in learning to read. Scores are given in terms of grade equivalents and descriptive categories. These categories are High, High Average, Low Average and Low Readiness. This instrument was used because much of the preliminary baseline control information had to be collected in retrospect (i.e., after readiness testing had already been done).

3. Reading Readiness Rating Sheet. This was devised to parallel the Lee-Clark Reading Readiness Test by using four similar categories of expectancy - Excellent, Good, Fair and Poor. It was felt that it

would be possible to obtain a more broadly based rating by using this in addition to a standardized instrument (e.g. it would be possible for the teacher to take into account such factors as behavioral stability, health, motivation, etc.).

4. Gates Primary Reading Test. Three part scores (Word Recognition, Sentence Reading, Paragraph Reading) are given as indices of students' achievement in reading. It was selected because of its wide acceptance and appropriateness for this purpose.

5. Standard Speech Diagnostic Test. This test was used in an effort to note the effects of an enrichment program on the articulatory and labeling errors made by children in these child care centers. It was not originally designed to yield a quantitative index, rather to elicit the spectrum of English speech sounds for diagnosis of articulatory problems.

No norms are provided and so the results were quantitatively tallied by incidence of error in the general categories of (1) articulatory errors, (2) labeling errors*, and (3) total errors - a combination of (1) and (2).

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* Labeling errors were characterized by (1) an inability to give any response to one or more stimulus pictures, (2) a constriction, or impoverishment, in the variety of words the subject could give in response to a stimulus picture, (3) wide dialectic deviation in labels used.

D. Testing of Experimental and Control Subjects

1. Peabody Picture Vocabulary Test

All children, with whom it was possible to work, were tested two times with the Peabody Picture Vocabulary Test. The initial, or baseline, measurement was done with Form A and by the Project Psychologist, Mr. Jack Nakashima. This baseline test was given as closely as possible to the child's entrance into the child care center. As a result baseline measurements obtained date back to the fall of 1962 and up through the fall of 1963. Therefore, the interval between the Form A testing and a retest with Form B varied. The averages of the test - retest intervals are reported in the next section on results. The spring 1964 retests at the control school were again done by Mr. Nakashima, while Mrs. Hansen administered the second testing at the experimental center. This was necessitated because of time and personnel requirements.

2. Lee-Clark Reading Readiness Test

All children, with the exception of the five-year old sub-group at the control center, were tested for reading readiness by their regular classroom teachers. Since no readiness testing was planned for spring 1964 at the control centers' adjoining school the Project Psychologist tested these children in a small group during the same time interval that the Stonehurst kindergarten was being tested.

The six-year old children were tested on the entrance into first grade. The five-year olds were tested at the end of their kindergarten year. The publisher provides adjusted norms for these two situations. Raw scores were used in analysis of scores of each sub-group. Grade equivalents were used in pooling the test results for the five and six year old groups for a part of the analysis.

3. Teacher Rating Sheets

A substitute teacher was provided one day in April 1964 for the purpose of freeing the three regular Stonehurst kindergarten teachers to rate their students on expectancy of success in learning to read in first grade. These ratings on an eight-point scale have been averaged. A categorical tally is also presented in making a comparison of the child care and total kindergarten groups.

4. Gates Primary Reading Test

The experimental six-year old children were tested by their regular classroom teachers in May 1964 but, inasmuch as no comparable testing was planned at the control school, the Research Assistant tested control six-year olds at approximately the same time.

5. Standard Speech Diagnostic Testing

These tests were administered by Mr. Nakashima during the fall and again in the spring. The same form was used in both instances because no alternate forms are available. The interval between tests was seven months.

IV. RESULTS

A. Changes in I.Q. Scores

An examination of Table 2 reveals the results of a test-retest study of changes in the I.Q. scores made by the children in the experimental and control centers.

It will be noted that the number of cases in the various age sub-groups are very small. Therefore, no significance may be attached to any seeming differences obtained. However, these data represent all the data it was possible to collect at the two centers. They represent virtually the total populations at the centers at the time of both testings. Although the sample size of the sub-group precluded separate analyses the total group numbers of 38 and 25 are large enough for statistical comparisons.

Table 2. Differences in Peabody Picture Vocabulary Test Scores (I.Q.) in Two Groups of Child Care Attending Children

	Chronological Age at Test 1 (Months)		Interval Between Test 1 and Test 2 (Months)		I.Q. at Test 1		I.Q. at Test 2		Difference in I.Q. Scores	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Six-Year Old Groups										
Stonehurst (N=13)	66.8	1.7	14.7	5.8	99.6	13.8	103.8	10.0	+4.2	12.9
Control (N=5)	70.0	—*	9.0	—*	99.4	—*	109.5	—*	+10.0	—*
Five-Year Old Group										
Stonehurst (N=11)	57.2	8.4	13.5	6.6	91.9	14.4	106.5	15.3	+14.6	5.0
Control (N=9)	59.3	5.1	11.9	5.3	94.9	11.0	106.4	12.7	+11.6	12.9
Four-Year Old Group										
Stonehurst (N=14)	46.4	5.9	11.9	5.5	87.3	17.6	114.1	14.4	+26.8	15.0
Control (N=11)	49.5	5.7	10.8	4.7	94.1	14.4	108.4	9.9	+14.3	11.5
TOTAL GROUP										
Stonehurst (N=38)	56.6	10.8	13.4	6.2	92.8	8.42	108.4	14.0	+15.5	14.0
Control (N=25)	57.1	9.4	10.7	5.0	95.4	12.1	107.9	11.0	+12.4	11.4

*(S.D. not computed because of sample size - N=5)

The columns giving the mean ages at the times of first testing and intervals between the test and retest are presented to illustrate that the groups were roughly comparable on this dimension. The experimental group at Stonehurst was tested at a slightly younger age and the interval between tests is nearly three months longer.

The differences in mean I.Q. gains between the experimental and control centers were not statistically significant for the five-year old, four-year old, or total group. The critical ratios are reported on Table 3. No critical ratios were computed for the significance of mean I.Q. differences between the Stonehurst and control six-year olds sub-groups because of the extremely small sample size at the control school.

Table 3. Differences in Sub-Group I.Q. Gains Made by Children in Stonehurst and Control Child Care Centers

	Stonehurst Child Care Attenders			Control Child Care Attenders				
I.Q. Gains	N	Mean Gain	S.D.	N	Mean Gain	S.D.	Difference Between Means	Critical Ratio
Five year olds	11	14.6	5.0	9	11.6	12.9	5.0	0.22
Four year olds	4	26.8	15.0	11	14.3	11.5	12.5	0.66
TOTAL GROUP*	38	15.5	14.0	25	12.4	11.4	3.1	0.21

*This group also includes the six-year old group at each center

The findings, therefore, do not confirm the hypothesis of greater I.Q. gain for experimental over control pupils. A question might also be raised as to the significance of I.Q. gains between test 1 and test 2 at each center. In other words, did differences of these magnitudes arise within chance expectation or are they reliable at acceptable levels of statistical confidence? The critical ratios presented in Table 4 indicate that these intragroup mean differences do reach the .01 level of significance. These differences have occurred well outside the limits of chance.

Table 4. Critical Ratios for Testing the Significance Between Test-Retest Mean I.Q.'s at Stonehurst and Control Child Care Centers

	Peabody Picture Vocabulary Test I.Q.'s - Test 1		Peabody Picture Vocabulary Test I.Q.'s - Test 2		Difference Between Mean I and Mean II	Critical Ratio
	Mean	S.D.	Mean	S.D.		
Stonehurst Child Care Center - Total Experimental Group N = 38	92.8	16.3	108.4	14.0	15.6	5.05
Control Child Care Center - Total Control Group N = 25	95.4	12.1	107.9	11.0	12.5	4.37

The relationships of the lengths of the intervals between tests and the magnitudes of the changes in I.Q.'s at the two centers is revealed in Table 5. Non-significant negative correlation coefficients of -.02 and -.03 for Stonehurst and the control school, respectively, indicate that the interval between test was not related to the sizes of I.Q. gains.

Table 5. Correlations Between Length of Interval Between Test 1 and Test 2 With Magnitude of I.Q. Score Change

	N	Pearson r
Stonehurst	38	-.02
Control	25	-.03

A negative correlation of -.27 was obtained between the age at initial I.Q. testing and the magnitude of I.Q. gain in the experimental group. It would appear that those experimental students who were given their preliminary I.Q. test at the youngest ages were the children who had a tendency to make the greatest gains in I.Q. scores on the second testing. This, however, is a matter for speculation, unsupported by a statistical test of correlation of this magnitude in this size of sample.* This size of correlation could be expected by chance expectation more often than would warrant confidence in the relationship it suggests. There is no support for the rejection of a null hypothesis - one suggesting that no relationship exists between these variables.

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* Using Fisher's formula for testing a coefficient of correlation the critical ratio of 1.68 fails to place the level of confidence below.05.

B. Reading Readiness Scores and Ratings

In April 1964 kindergarten children at Stonehurst Elementary School were rated by their teachers on the eight-point rating scale as to how successful the teacher expected each child to be in learning to read in Grade one. The ratings received by kindergarteners who also attended the child care center enrichment program and the kindergarten class as a whole are shown on Tables 6 and 7 below.

Table 6. Mean Ratings on Expectancy of Student's Success in Learning to Read in First Grade Received by Kindergarteners at Stonehurst Elementary School from Their Teachers in April 1964

	Stonehurst Kindergarteners Attending Child Care N = 13	Stonehurst Kindergarten (All Five Classes) N = 129
Mean Expectancy Rating	4.92	4.87
Standard Deviation	2.40	1.44

(The difference between the Mean rating received by these two groups failed to reach the .05 level of confidence.)

There was a greater degree of variability in the ratings received by the child care center children as reflected in the standard deviations.

The difference of .05 rating points between the means for the child care and total groups is of no practical significance because of its size. The mean ratings received by both groups, 4.92 and 4.87, are equivalent to the "good expectancy" rating, since the statistical lower limit of the "good rating" interval is 4.50. Another way of looking at the ratings received by these children is presented in Table 7. Basically, the same picture is presented in Table 7 as was presented in Table 6.

Table 7. Ratings of Students' Expectancy of Success in Learning to Read in First Grade Received by Kindergarteners at Stonehurst Elementary School from their Teachers

	Stonehurst Kindergarteners Attending Child Care		Stonehurst Total Kindergarten	
	N	%	N	%
Excellent Expectancy	2	15.4	19	14.7
Good Expectancy	7	53.8	57	44.2
Fair Expectancy	3	23.1	47	26.4
Poor Expectancy	1	7.7	6	4.7
TOTALS	13	100.0	129	100.0

A comparison of the reading readiness by two sub-groups in both the experimental and control centers is given in Table 8. The Lee-Clark Reading Readiness Test was administered to both groups of children - to the first grade on their entrance into grade one and to the kindergarteners at the end of their kindergarten year. Comparisons of these two sub-groups in the two centers is presented in raw score units. The mean scores received by both the six-year olds and the five-year olds are very close in both centers.

Table 8. Raw Scores Received by Child Care Children on Lee-Clark Reading Readiness Test

	Children Attending Stonehurst Child Care Center			Children Attending Control Child Care Center			Difference Between Means	Critical Ratio
	N	Mean Raw Score	S.D.	N	Mean Raw Score	S.D.		
First Grade (Tested 9/63 when entered grade one)	11	52.8	10.9	7	52.6	6.6	0.8	0.06
Kindergarteners (Tested 5/64 at end of Kindergarten year)	11	49.5	9.1	12	49.3	6.8	0.2	0.02

Using norms intended for converting first grader's scores into grade equivalent scores, the Stonehurst group receives a grade rating of 1.0 as compared to 1.1 received by the control children. The critical ratio of .06 for this small difference in scores indicates no significance may be attached to the difference obtained. The grade equivalent score received by the Stonehurst kindergarteners was 1.3. The corresponding score for the control group is 1.2*. It is important to note, however, that the .1 difference in grade placement units results from a raw score difference of only .2 points. Again the critical ratio fails to lend confidence in the significance of these small differences.

*These raw scores have been converted to grade score equivalents by use of norms intended for kindergarteners.

Since the tests were administered to the five-year old and six-year old sub-groups at different times in their respective school careers it was necessary to use comparable form of scores for the two age groups in order to pool the results into a general category of "all children attending child care centers who were tested with the Lee-Clark Reading Readiness Test." Kindergarten children would not be expected to make raw score as high as first grade children. Since the publishers have provided norms for both first grade and kindergarten and since grade equivalent scores are available for each respective group this form of score has been used for the comparison in Table 9.

Table 9. Grade Equivalent Scores Received by Child Care Center Attending Children on the Lee-Clark Reading Readiness Test

	Children Attending Stonehurst Child Care Center			Children Attending Control Child Care Center			Difference Between Means	Critical Ratio
	N	Mean	S.D.	N	Mean	S.D.		
Total Group (All child care attending first graders and kindergarteners tested on reading readiness)*	22	1.27	0.55	19	1.24	0.47	0.03	0.09

*Group I norms used for first graders; Group II norms used for kindergarteners.

It will be noted that only .03 of a grade placement score point separates the means of the two total groups. This magnitude of difference in this small sample is of no practical or statistical significance.

A question may be raised in reference to the ages and intelligence quotients of children used in the comparisons made in Tables 8 and 9. This information is presented in Table 10 below. The Stonehurst children are slightly older (2.5 months) and, as a total group, less than two points (mean difference) higher I.Q. The overall picture, however, is one of fairly close comparability. There are no particular relationships suggested between these results and those on the above two tables.

Table 10. Comparison of C.A. and I.Q. of Students Tested with Lee-Clark Reading Readiness Test at Stonehurst and Control Child Care Centers.

	Children Attending Stonehurst Child Care Center			Children Attending Control Child Care Center		
	N	Mean	S.D.	N	Mean	S.D.
Chronological Age: (May 1964)						
First Graders	11	83.3 mos.	—	7	80.6 mos.	—
Kindergarteners	11	72.0 mos.	—	12	71.8 mos.	—
Total Group	22	77.6 mos.	6.2	19	75.1 mos.	6.3
I.Q. (Peabody Picture Vocabulary Test)						
First Graders	11	100.7	—	7	102.1	—
Kindergarteners	10	92.9	—	12	91.3	—
Total Group	21	97.0	14.6	19	95.3	10.8

One more comparison with the reading readiness scores of the Stonehurst child attenders will be made. This is a comparison between the scores made by the 1963-64 kindergarten child care enrichment program attenders and the 1963-64 kindergarten group as a whole. These data are presented on Table 11. It is evident from these data that the performance of the child care kindergarteners on the reading readiness test was no better or poorer than that of the kindergarten group as a whole. This is based on the fact that there was only a small raw score difference in the means of the two groups and the obtained critical ratio was not found to be significant.

It is not known whether the two groups were alike in intellectual ability, experiential background, etc., but the average ages of the respective groups were not significantly different. In other words, the age difference factor was not great enough to be expected to influence reading readiness scores.

Table 11. Reading Readiness Scores Made by Stonehurst Kindergarteners, May 1964

	Stonehurst Kindergarteners Attending Child Care Enrichment Program			Total Stonehurst Kindergarten Class			Differences Between Means	Critical Ratios
	N	Mean	S.D.	N	Mean	S.D.		
Chronological Age	11	72.0 mos.	2.3	113	71.0 mos.	2.0	1.0	1.33
Lee-Clark Reading Readiness Test Raw Score	11	49.5	9.1	113	46.6	10.4	2.9	0.85

(The differences between the above means failed to reach the .05 level of confidence.)

C. Reading Achievement Scores

All first grade students, including the child care attending first graders, were given the Gates Primary Reading Test in May 1964. In addition, the group of first grade children attending the control child care center were tested with this instrument.

Information relating to the age and intellectual comparability of the three groups is presented in Table 12. It will be noted that the Stonehurst first grade, as a whole, is older than either of the child care groups. The average I.Q. of the control child care first graders is nearly seven points higher than the Stonehurst Child Care group. No I.Q. information was available for the Stonehurst first grade as a whole.

Table 12. Comparison of Two Groups of First Grade Child Care Attenders and the Total Stonehurst First Grade on Chronological Age and I.Q.

	First Graders at Stonehurst Child Care Center		First Graders at Control Child Care Center		First Graders at Stonehurst Elementary School (Total Class)	
	N	Mean	N	Mean	N	Mean
Chronological Age	12	82.0 mos.	7	83.4 mos.	170	84.1 mos.
I.Q. (Peabody Picture Vocabulary Test - Form A)	12	95.7 mos.	7	102.1 mos.	—	——

A comparison of the scores of these three groups in the Gates Primary Reading sub-tests is presented in Table 13. On the word recognition sub-test the Stonehurst child care students and Stonehurst first grade as a whole received very nearly the same raw score and corresponding grade equivalent. The seven control child care students received a higher score than the other two groups in this area. The significance of the magnitude of this mean difference remains a matter for speculation, however, due to the size of this sub-group.

The control child care first graders were not given the sentence reading sub-test due to problems of test scheduling. The comparison of the Stonehurst total first grade with the child care group reveals that the child care children did less well than their classmates. The magnitude of the mean difference is small, about one grade placement unit.

The mean raw scores of the three groups on the paragraph reading sub-test are within one point of each other. The variation between the corresponding grade equivalents is also very small.

Table 13. Achievement Test Scores of Two Groups of First Grade Child Care Attenders and Total Stonehurst First Grade on Gates Primary Reading Test

GATES PRIMARY READING TEST	First Graders at Stonehurst Child Care Center			First Graders at Control Child Care Center			First Graders at Stonehurst Elementary School (Total Class)		
SUB-TESTS:	N	Mean Raw Score	Grade Equiv.	N	Mean Raw Score	Grade Equiv.	N	Mean Raw Score	Grade Equiv.
Word Recognition	12	19.4	2.19	7	24.3	2.33	168	18.2	2.17
Sentence Reading	12	13.2	2.19	(Not given to this group)			158	16.6	2.3
Paragraph Reading	12	10.6	2.25	7	10.9	2.2	161	11.5	2.27

Overall there is no clear superiority or inferiority in the performance of any sub-group on this reading achievement test.

D. Changes in Performance on Standard Speech Diagnostic Test

It was possible to examine the Standard Speech Diagnostic before and after test protocols of 19 four and five-year olds at Stonehurst Child Care Center and 18 children of the same age at the control child care center. Many more speech diagnostic tests had been administered to children of these ages but in many cases a follow-up testing was precluded by various factors referred to in previous paragraphs.

Since these data represent the universes of data available at each center and since there is such a difference in the mean number of articulatory errors at test I, it is realized that the control group does <u>not</u> approximate a suitable control group for the group involved in the language enrichment program at Stonehurst. Elimination of cases having no matches at one or the other center would have reduced the group sizes beyond their present low numbers. This then did not offer a solution to the problem of group comparability either.

Table 14 summarizes the results of the two testings of these child care groups. It should be borne in mind that these figures represent numerical tallies of the incidence of errors — there are no known norms available for this instrument.

Table 14. Changes in Performance on Standard Speech Diagnostic Test of Stonehurst and Control Center Four and Five-Year Olds.

	STANDARD SPEECH DIAGNOSTIC TEST	
	Stonehurst Child Care (10 four-year olds, nine five-year olds)	Control Child Care (10 four-year olds, eight five-year olds)
<u>Articulatory Errors</u>	N=19	N=18
Fall Mean	15.9	7.1
Spring Mean	11.1	8.3
Mean Difference	4.8*	-1.2*
	*(30% decrease)	*(17% increase)
<u>Labeling Errors</u>		
Fall Mean	12.8	10.6
Spring Mean	9.1	6.7
Mean Difference	3.7**	3.9**
	**(29% decrease)	***(37% decrease)
<u>Total Errors</u>		
Fall Mean	28.7	17.7
Spring Mean	20.2	15.1
Mean Difference	8.5***	2.6***
	***(30% decrease)	***(15% decrease)

The present analysis is admittedly simple but it will be noticed that there was a consistent decline in the mean number of both type errors made by Stonehurst group. The increase in the mean number of articulatory errors in the control group is relatively small. The small number of cases would detract from its possible significance. The labeling errors of the control group showed a decrease in number as was the case in the mean tally of total errors.

In which group the improvement was the most significant is not clear. One must take into account the baseline values for the two groups. The control group started with fewer errors in all tallies. This group maintained this position at the second testing but its "superiority" was, at this latter time, less great.

It is interesting to observe the I.Q. changes which took place in this speech diagnostic test comparison groups during approximately the same period of time.

Table 15. Changes in I.Q. Scores of Children Involved in Study of Changes in Performance on Standard Speech Diagnostic Test (See Table 14 Above)

	Stonehurst Child Care Attenders (Ten five-year olds, eight four-year olds)	Control Child Care Attenders (Ten five-year olds, eight four-year olds)
	I.Q.	I.Q.
Mean Test I	90.0	92.8
Mean Test II	113.4	105.6
Mean Difference	23.4 I.Q. gain	12.8 I.Q. gain

At test I both groups were lower end of the traditional "normal" classification and less than three points apart in mean scores. On the retest both groups had made impressive gains but those in the Stonehurst group were much larger - nearly twice as large numerically.

V. DISCUSSION OF RESULTS

The initial intention of these evaluation efforts, that of demonstrating a clear advantage in language development in an experimental group of child care children as compared to a control group of comparable children, has not been realized.

In cases where the two groups were initially comparable, the comparisons between the Stonehurst enriched groups and the control groups failed to demonstrate any clear superiority of the enrichment group in (1) I.Q. score gains, (2) reading readiness scores, or (3) reading achievement scores.

The significance of the data from the speech diagnostic testing is not clear in light of the incomparability of the two child care groups on their initial testing. Another factor precluding further interpretation is the absence of data or norms giving "normal" expectancies of error dimunition. Perhaps the observed error (score) changes really constituted nothing more than normal growth in groups such as these. There is nothing to suggest that either the enrichment child care program or the routine child care program were instrumental in effecting speech changes in these children.

Comparisons of these groups, experimental and control, to the Stonehurst kindergarten and first grade total groups reveals no particular deviation in reading readiness or reading achievement. No support is given to the original grant proposal assuming that child care students, unaided, will not be ready for or progress in the schools' language program. One must hasten to add that this evaluation study does not present a refutation of this assumption for two primary reasons: (1) The study

samples were extremely small and represent only two child care centers. (2) The instruments used in the evaluation could have conceivably been insensitive to some basic manifestations of deprivation - e.g. lack of motivation, absence of potential for expanding experiential background, etc., which may later preclude normal progress.

The data on I.Q. changes, while they do not demonstrate or suggest any superiority of the program at either center, do stimulate some speculation on the reasons for changes of these magnitudes. Ordinarily one would expect children at these ages to receive approximately the same deviation I.Q. score at test and retest. At least this would be true in large groups as is inferred by the publishers' data relating to the stability of measurements.*

Our two samples do not manifest this expected I.Q. stability. Several explanatory hypotheses might be put forth. (1) "Children from environments experienced by these child care attenders do not perform as well as the general population on typical I.Q. measuring instruments prior to extended exposure to school-like, mainstream-culture-like surroundings." (2) "The experience of child care attendance enabled these children to perform more nearly at true potential on the second than on the first test." (3) "Actual improvement in mental functioning occurred as the result of attendance in child care centers."

The full support of these suppositions is not, however, within the scope of this study.

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*Dunn, Lloyd M. Peabody Picture Vocabulary Test (Manual), American Guidance Service, Inc. Philadelphia, c. 1959, pp 29-30

VI. CONCLUSIONS

A. From the data obtained with the measuring instruments used in this evaluation study, no superiority has been demonstrated in children attending the child care language enrichment program as compared to other similar child care children on reading readiness, reading achievement, or intelligence quotient gains.

B. Children attending child care centers in the two sub-communities studied have shown significant gains in I.Q.

C. The children attending the Stonehurst Child Care program did not deviate significantly from their classmates on reading readiness or reading achievement insofar as it is possible to be determined in the small study samples and with the measuring instruments utilized.

D. Certain enrichment benefits may have occurred in one or both of the child care groups, but were not sampled by the evaluative techniques employed in the study.

RATING SCALE OF READINESS FOR BEGINNING INSTRUCTION IN READING

Various experiences are provided in kindergarten which are aimed at developing readiness for beginning formal reading instruction in the first grade. At the time children enter first grade we know that some may be reading already; some are just then ready to begin to learn to read; and others may need additional experiences and/or time to mature sufficiently before beginning formal instruction.

On the basis of the information you have from your contacts with and observations of the children in your class will you please indicate your estimation of how successful you expect each child to be in learning to read in the first grade. The ratings range from an "excellent expectancy" of success to a "poor expectancy" of success. Please circle a number to indicate your rating.

NAMES	Excellent Expectancy		Good Expectancy		Fair Expectancy		Poor Expectancy	
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1
	8	7	6	5	4	3	2	1